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The USENIX Association Newsletter

Volume 8 Number 3

June 1983

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The deadline for submissions for the August issue of ;login: is July 29

## NOTICE

*;login:* is the official newsletter of the USENIX Association, and is sent free of charge to Individual, Public and Institutional members of the Association.

The USENIX Association is an organization of AT&T licensees, sub-licensees, and other persons formed for the purpose of exchanging information and ideas about UNIX\* and UNIX-like operating systems and the C programming language. It is a not-for-profit corporation incorporated under the laws of the State of Delaware. The officers of the Association are:

President	Lou Katz	Directors	Bruce S. Borden
Vice-President	John L. Donnelly		Alan G. Nemeth
Secretary	Lewis Law		Deborah K. Scherrer
Treasurer	Thomas Ferrin		Waldo M. Wedel

The Executive Director of the Association and editor of *;login:* is Tom Strong.

Membership information can be obtained from the Association office:

USENIX Association  
P.O. Box 7  
El Cerrito, CA 94530  
(415) 528-UNIX

Members of the UNIX community are heartily encouraged to contribute articles and suggestions for *;login:*. Your contributions may be sent to the editor electronically at

ucbvax!g:usenix

or through the US mail to the Association office at the address above. The USENIX Association reserves the right to edit submitted material.

*;login:* is produced on UNIX using *troff* and a variation of the *-me* macros. We appreciate receiving your contributions in *n/troff* input format, using any macro package. If you contribute hardcopy articles please leave left and right margins of 1" and a top margin of 1½" and a bottom margin of 1¼". Hardcopy output from a line printer or most dot-matrix printers is not reproducible.

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## The USENIX Association Toronto Conference

The Summer, 1983, technical meetings of the USENIX Association and the Software Tools Users Group will be held July 12→15 in Toronto, Ontario, Canada, at the Harbour Castle Hilton Hotel. The host of the meeting will be Human Computing Resources Corporation. The local arrangements chairperson is Suzanne MacNary. Local arrangements are being handled by Rogal Boston. The technical program chairperson for USENIX is Michael Tilson of HCR and for the Software Tools Users Group is Neil Groundwater of Analytical Disciplines of Vienna, VA.

The Toronto conference will feature tutorials, a technical meeting and a vendor exhibit. The agenda for the meeting is printed in another article. The schedule of events is:

Tuesday	9:00am— 5:00pm	USENIX Tutorials
		• 4.2BSD File Systems — Facilities & Implementation
		• The UNIX Shells
		• Advanced C
	9:00am— 5:00pm	Vendor Exhibits
	1:00am— 5:00pm	Software Tools Users Group Tutorial
		• Software Tools: Portable UNIX—like Software in the Public Domain
	7:00pm—11:00pm	Software Tools Users Group Technical Presentations
Wednesday	8:45am— 5:30pm	USENIX Technical Presentations
	9:00am— 5:00pm	Vendor Exhibits
	5:30pm— 7:00pm	Open meeting of the USENIX Board with Members
	evening	Reception at the Ontario Science Center
Thursday	8:45am— 5:00pm	USENIX Technical Presentations
	9:00am— 5:00pm	Vendor Exhibits
	10:00pm— 3:00am	IMAX Show
Friday	9:00am— 5:00pm	USENIX Technical Presentations

Conference proceedings may be ordered at the meeting or afterwards. Ordering information will be printed when it is available.

Registration and vendor reservations are being received at a faster pace than was the case for the Boston meeting so a good turnout is expected.

A meeting announcement was mailed in early April and a registration packet was mailed in May. Further information on the meeting may be obtained from:

Rogal Boston  
72 Langley Road  
Newton Centre, MA 02159  
(617) 965-1000

The Association office will have a desk at the conference to handle any membership, office, ;login:, or tape distribution business.

## **Fortune Systems to Sponsor IMAX Show during Toronto Conference**

In January, USENIX convened in San Diego, near the first OMNIMAX theatre in the world, and we were fortunate to be able to attend a special screening. In July, USENIX will convene in Toronto, near the first IMAX theatre in the world. Our destiny is clear. There shall come to pass

### **THE IMAX MOVIE MARATHON**

or

### **UNIX<sup>†</sup> MEETS IMAX<sup>‡</sup>**

a special screening of several IMAX films at the Cinesphere (an Imax theatre) in Ontario Place (a theme park owned by the province of Ontario on Lake Ontario near downtown Toronto).

Imax is a high resolution motion picture system projected onto a very large rectangular screen (60x80 feet at the Cinesphere) backed by high fidelity six channel sound. Since the introduction of IMAX in 1970, many films have been made which exploit the medium, including the well-known film "To Fly", which we will screen if possible. (OMNIMAX, the sister process to IMAX, is projected onto the inside of a hemispherical screen, while IMAX is projected onto a more traditional flat screen in front of the audience.)

The show will be at 10pm on Thursday, July 14. For the benefit of those who only want to stay for a couple of hours, we will try to play the most popular films at the beginning of the show. For the diehard fans, and there are many of us, the show will continue until 3am.

Details on how to obtain tickets will be announced at the conference. The Cinesphere seats 800 people.

. . . Dave Yost, Fortune Systems

## **Comments Due on the UniForum Draft Standard**

Comments on the UniForum (formerly /usr/group) Standards Committee draft Systems Standard Interface proposal are due by July 6, 1983.

The next Standards Committee meeting will be held in Toronto on July 12 in conjunction with the USENIX meeting. Those interested in participating in the Standards Committee activities should contact

Heinz Lycklama  
Chairman, UniForum Standards Committee  
Interactive Systems Corporation  
1212 Seventh Street  
Santa Monica, CA 90401

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<sup>‡</sup> IMAX is a trademark of IMAX Corporation.

<sup>†</sup> UNIX is a trademark of Bell Laboratories.

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## Agenda for the USENIX Association Toronto Conference

### WEDNESDAY

Schedule	Length	Author(s)	Title
8:45-11:45		SESSION A/B — Opening Session Chair: Michael Tilson	
8:45- 9:30	45		Opening Remarks, USENIX
9:30-10:15	45	Lesk	Keynote address: Technology Driven Software vs. Psychology of Users: An Irresistible Force Meets an Immovable Object
10:15-10:45	30	BREAK	
10:45-11:45 11:45- 1:30	60	AT&T LUNCH	UNIX Licensing and New Product Offerings
1:30- 3:00		SESSION A — Programming Tools 1 Chair: Joseph Yao	
1:30- 1:55	25	Baecker, Breslin & Sturgess	On Enhancing the Presentation of C Source Code
1:55- 2:15	20	Nakamura & Murai	On-Line Manual System for Software Development on UNIX
2:15- 2:35	20	Kendall	Bcc: Runtime Checking for C Programs
2:35- 2:55	20	Farley, Kunkel & Thompson	CDB — a C Source Language Debugger
1:30- 3:00		SESSION B — UNIX Implementation 1 Chair: Michael Blake-Knox	
1:30- 1:55	25	Holt, Mendell & Perelgut	Tunis: A Portable, UNIX Compatible Kernel Written in Concurrent Euclid
1:55- 2:20	25	Gien	The SOL Operating System
2:20- 2:40	20	Barrett	An Implementation of UNIX for the Intel iAPX 286
2:40- 3:00	20	Whistler	UNIX a la Data General
3:00- 3:30	30	BREAK	

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3:30- 5:00		<b>SESSION A — Programming Tools 2</b>	
		Chair: Ian Darwin	
3:30- 3:55	25	Bryan	VCHK — A program for Updating and Maintaining Software Distributions
3:55- 4:15	20	Hirgelt	Enhancing <i>make</i> or Re-inventing a Rounder Wheel
4:15- 4:35	20	McGowan, Anderson & Brumm	Mm4 — <i>make</i> with M4 Tools for Maintaining Makefiles
4:35- 5:00	25	Novak	Using <i>make</i> Effectively
3:30- 5:00		<b>SESSION B — UNIX Implementation 2</b>	
		Chair: Phyllis Bregman	
3:30- 3:55	25	Patriquin	File System Considerations in a Multiple Process UNIX Environment
3:55- 4:15	20	Wilens	A High Performance Implementation of UNIX for the IBM Series/1
4:15- 4:35	20	Dunietz & Powell	The Use of the Z80 I/O Processor by the TRS-XENIX Operating System
4:35- 4:55	20	Neff	Virtual memory Management in GENIX

#### THURSDAY

Schedule	Length	Author(s)	Title
8:45-10:00		<b>SESSION A — User Interface 1</b>	
		Chair: Barbara Arlow	
8:45- 9:10	25	Perlman	The Interface Arsenal
9:10- 9:40	30	Buxton, Lamb, Sherman & Smith	A User Interface Management System
9:40-10:00	20	Tuori	Talking to UNIX — Some Experience with Speech Input
8:45-10:00		<b>SESSION B — UNIX Implementation 3</b>	
		Chair: David Martindale	
8:45- 9:00	15	Lucas & Lycklama	A General-Purpose Object-File Format
9:00- 9:15	15	Hoover	A User Information Data Base for UNIX (What to do when <i>/etc/passwd</i> just isn't enough)
9:15- 9:40	25	Daniel	Z — A High Performance Raster Graphics Package for UNIX Operating Systems
9:40-10:00	20	Cole	Attaching an Array Processor in the UNIX Environment
10:00-10:30	30	BREAK	

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10:30-11:45		<b>SESSION A — User Interface 2</b>	
		Chair: Robert Pike	
10:30-10:50	20	Steffen & Veach	The Edit Shell — Combining Screen Editing with the History List
10:50-11:15	25	Korn	KSH — A Shell Programming Language
11:15-11:40	25	Mankins & Franklin	A Simple Window Management Facility for the UNIX Time-sharing System

10:30-11:45		<b>SESSION B — Compilers and Languages 1</b>	
		Chair: Jean Wood	
10:30-10:50	20	Ryan, Spiller & Weil	A New Portable Compiler for Xenix
10:50-11:20	30	Cox	Objective C Compiler: Programming Smalltalk-80 Methods in C
11:20-11:40	20	Zelitzky & Srivastava	Compilers on the NS16000
11:45- 1:30		<b>LUNCH</b>	

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1:30- 3:00		<b>SESSION A — UNIX Implementation 4</b>	
		Chair: A.R. White	
1:30- 1:55	25	Ross & Taylor	UNIX Support for Guaranteed Real-Time Processing
1:55- 2:20	25	Teixeira	High Speed Laboratory Data Acquisition on the MC-500
2:20- 2:40	20	Kridle	Performance Effects of Disk Subsystem Choices for VAX Systems Running 4.2BSD UNIX
2:40- 3:00	20	Lutz & Shon	Running the UNIX Kernel in User Mode

1:30- 3:00		<b>SESSION B — Compilers and Languages 2</b>	
		Chair: Jean Wood	
1:30- 1:55	25	Isaacson	QL: A General Purpose Programming Language with an Embedded Data Base Interface
1:55- 2:25	30	Cordy & Holt	Turing: A New General Purpose Language Under UNIX
2:25- 2:55	30	Tanenbaum, Staveren & Keizer	A UNIX Tool Kit for Making Portable Compilers
3:00- 3:30	30	<b>BREAK</b>	

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3:30- 5:15		<b>SESSION A — UNIX Directions</b>	
		Chair: Michael Tilson	
3:30- 4:00	30	Pike	UNIX Style, or "cat -v" Considered Harmful
4:00- 4:15	15	Balter	Everything You Wanted to Know About System V, and Then Some
4:15- 4:30	15	Chambers & Quarterman	A Practical Comparison of 4.2BSD and System V
4:30- 4:55	25	O'Dell	Berkeley UNIX after 4.2BSD — Where is it Going and Why Do We Want to Get There?
4:55- 5:15	20	PANEL	Panel Discussion: Where is UNIX Going, and Should It Go There?
3:30- 5:00		<b>SESSION B</b>	(This time is open to allow daytime scheduling of birds-of-a-feather sessions.)

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#### FRIDAY

Schedule	Length	Author(s)	Title
8:45-10:00		<b>SESSION A — Networking</b>	
		Chair: Michael O'Dell	
8:45- 9:10	25	Gafke & Bergan	Local Network with Virtual Ports
9:10- 9:35	25	Wambecq	NETIX: A UNIX-based Network-using Operating System
9:35-10:00	25	Foster	EtherTIP — A Virtual Terminal Interface to Ethernet
8:45-10:00		<b>SESSION B — Applications</b>	
		Chair: Barbara Arlow	
8:45- 9:05	20	Haenlin	A Data Base Frontend, Driven by Tables Generated from a Data Dictionary
9:05- 9:30	25	Wolfe & Hustler	A Powerful Accounting Package for UNIX-Based Systems
9:30-10:00	30	Smith	Writer's Workbench Software at Colorado State University
10:00-10:30	30	BREAK	

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10:30-11:45		<b>SESSION A — UNIX Mail</b> Chair: Michael O'Dell	
10:30-10:50	20	McKie	Where is Europe?
10:50-11:20	30	O'Dell	UNIX and Electronic Mail: Trials, Tribulations, and Proposals
10:20-11:45	25	PANEL	Panel Discussion: Whither network mail and news?

10:30-11:45		<b>SESSION A — Standards, Validation, and Portability</b> Chair: Michael Tilson	
10:30-10:55	25	Fostel & Naylor	Developing a UNIX Validation Suite
10:55-11:15	20	Franke & Truscott	Early Experiences with UNIX on the Gould S.E.L. Concept Computer
11:15-11:30	15	Scheulen	UNIX Version 7 Compatibility under Systems 3/5
11:30-11:45	15	Lycklama	Status Report from the /usr/group Standards Committee
11:45- 1:30		LUNCH	

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1:30- 3:00	1:30	<b>SESSION A — Open session: Applications</b> Chair: Ian Darwin	
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1:30- 3:00	1:30	<b>SESSION B — Open session: Systems</b> Chair: Henry Spencer	
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These talks will be scheduled first-come, first-serve. Speakers may sign up to give talks starting Wednesday morning. 10 minutes per speaker, any topic allowed. Titles and author addresses only will be printed in the conference proceedings. Scheduling closes Wednesday night to allow printing of a schedule. Sessions may extend to 5pm if there is sufficient interest.

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## Usenet: The Network News

*Mark R. Horton*

Bell Laboratories

cbosgd!mark

### What is the Network News?

Usenet (Users' Network) is a bulletin board shared among many computer systems in the computer science community, around the United States, Canada, Europe, and Australia. There are currently around 500 machines on the network.

Usenet is a logical network, sitting on top of several physical networks, including UUCP, BLICN, BITNET, various **Berknets** and **Ethernets**, and the **Arpanet**. Sites on Usenet include many universities, private companies and research organizations. Most of the members of Usenet are either university Computer Science departments, private companies, or part of Bell Telephone Laboratories. Currently, most Usenet sites run the UNIX operating system, although there are Usenet sites running VMS, IBM's OS/360, and the Z80 MARC system.

The network news, or simply *netnews*, is the set of programs that provide access to the news, and transfer it from one machine to the next. Netnews was originally written at Duke University, and has been modified extensively by the University of California at Berkeley. Netnews allows articles to be posted for limited or very wide distribution. This document contains a list of newsgroups that were active at the time it was written, to assist you in determining the newsgroups to which you may want to subscribe. When creating a new article, the level of distribution is controlled by specifying the newsgroup.

Any user can post an article that will be sent out to the network to be read by persons interested in that topic. Users can specify which topics they are interested in via a *subscription list*. Then, whenever they ask to read news, they will be presented with all articles of interest that have not yet been read. There are also facilities for browsing through old news, posting follow-up articles, and sending direct electronic mail replies to the author of an article.

### Why Usenet?

Usenet is useful in a number of ways. Someone wishing to announce a new program or product can reach a wide audience of interested people. A user can ask "Does anyone have an *x*?" and will usually get several responses within a day or two. Bug reports and their fixes can be made quickly available without the usual overhead of sending out mass mailings. Discussions involving many people at different locations can take place without having to get everyone together.

Another facility with similar capabilities to *netnews* is the *electronic mailing list*. A mailing list is a collection of electronic mailing addresses of users who are interested in a particular topic. By sending electronic mail to the list, all users on the list receive a copy of the article. While the mailing list facility is quite useful, Usenet offers a number of advantages not present in mailing lists. Getting yourself on a mailing list is not always easy. You have to figure out who maintains the list and ask them to put you on it. Often these people are out of town or busy, and don't put you on the list for several days. Sometimes you have to send mail to the entire mailing list, hoping that one of the readers will tell you who maintains the list. Once you are on the list, you often find yourself in the middle of a discussion. Netnews keeps old articles around until they expire (usually about two weeks) so you can browse through old news to catch up on what you missed. Similarly, referring to an old article is easy, without having to keep a personal file of all old mail.

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Another advantage is appreciated by the users of the system. There is less overhead in having only one copy of each message sent to each machine, instead of having separate copies sent to each of several users on the same machine. This cuts down on computer time to process the messages, and on line costs for telephone calls to transfer messages from one machine to another (when phone lines are used). Another advantage is in the disk space consumed. When only one message is sent to each system, only one copy of the message is kept on disk. In a mailing list environment, each user has a copy in their own mailbox.

Another similar system is called **Notesfiles**. This system originated on CDC's Plato system, and a UNIX implementation exists. Some Usenet sites run Notesfiles instead of or in addition to Netnews. Notesfiles is best known for its screen oriented user interface.

## How do I Read News?

In the Usenet jargon, topics are called *newsgroups*. A partial list of current newsgroups appears in figure 1. You have your own *subscription list* of newsgroups to which you are said to *subscribe*.

There are different classes of newsgroups. Network newsgroups, e.g., **net.misc**, are sent to the entire network. Geographic areas and organizations can have local newsgroup classes, too. The newsgroup **nj.general** is only sent to machines in New Jersey. The company newsgroup **bell.all** is sent to all Bell System machines. Local newsgroups such as **general** stay on the local machine. For example, **general** might be used to post announcements of downtime or new software of interest to the local users. "From the Arpanet" (**fa**) newsgroups are used to gateway Arpanet mailing lists into Usenet.

To read news, type the command

**readnews**

Each newsgroup to which you subscribe will be presented, one article at a time. As each article is presented, you will be shown the *header* (containing the name of the author, the subject, and the length of the article) and you will be asked if you want more. There are a number of possible choices you can make at this point. You can type "y" for "yes" (or simply hit return) and the rest of the message will be displayed. Another choice you can make is "n" for "no". This means you are not interested in the message — it will not be offered to you again.

Among the other commands you can type after seeing the header of an article are:

**q** Quit. The articles you have read or ignored are recorded and you are returned to the shell.

**s filename**

The article is saved in a disk file with the given name.

**r** Reply to the author of the message. You will be placed in the editor, with a set of headers derived from the message you are replying to. Type in your message, and exit the editor. The reply will be sent off via electronic mail. You are then returned to readnews.

**f** Post a follow-up message to the same newsgroup. This posts an article on this newsgroup with the same title as the original article. You will be placed in the editor — enter your message and exit.

**U** Unsubscribe from this newsgroup.

Variants of many commands use a "-" to refer to the previous message, e.g., "r-" replies to the previous message, whose complete contents you have now seen.

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## Submitting Articles

To submit a new news article type

**postnews**

You will be prompted for the newsgroup, title, and distribution on your terminal. Then you will be placed in the editor. Enter the text of your article, and then exit the editor. The article will be posted to the newsgroups specified, and distributed to the appropriate machines across the network.

## Joining Usenet

Admission to Usenet is open to anyone interested. An interested site administrator should first find a nearby Usenet site that is willing to feed them news. Then the two administrators set up a *uucp* connection between the two sites, and transfer the Usenet software over the link. (The "B news" software is in the public domain, and comes with full documentation and installation instructions.) Next they set up the news connection. Test articles are sent over the link, and then the new site announces itself to the newsgroup **net.news.newsite**. (The list of Usenet sites, their Usenet neighbors, and who the contact persons are, is published monthly in **net.news.map**.) Once you have accepted a link from a site, unless there are good reasons not to, you should be willing to feed two or three more new sites in turn.

No money is charged for the news itself or the software, but it is up to the two sites to make arrangements for any phone bills involved. There are Usenet sites in nearly every major metropolitan area in the United States and Canada, with especially heavy concentrations in New Jersey, Illinois, and Silicon Valley. If you know of a nearby Usenet site, you can either connect to them (if they are willing), or ask them to look in **net.news.map** to find you a nearby site. If you don't know of a nearby Usenet site, call me at (614) 860-4276 and I'll refer you to one.

Figure 1 — Partial Newsgroup List

This is a list of some major Usenet newsgroups as of May 24, 1983.  
The full list is maintained by Adam Buchsbaum (research!alb).

Newsgroup	Description
net.announce	Moderated newsgroup for important announcements.
net.auto	Automobiles and automotive products and laws.
net.bugs	General bug reports and fixes.
net.bugs.4bsd	Subgroup for UNIX version 4BSD related bugs.
net.bugs.uucp	Subgroup for <i>uucp</i> related bugs.
net.columbia	The space shuttle and the STS program.
net.cse	Computer science education.
net.eunice	The SRI Eunice system.
net.games	Games and computer games.
net.garden	Gardening, methods and results.
net.graphics	Computer graphics, art, and animation.
net.jobs	Job announcements, requests, etc.
net.jokes	Jokes and the like. May be slightly offensive.
net.lan	Local area network hardware and software.
net.lang	Different computer languages.
net.lang.c	Subgroup for C.
net.mail	Proposed new mail/network standards.
net.med	Medicine and its related products and regulations.
net.micro	Micro computers of all kinds.

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net.micro.68k	Subgroup for 68k's.
net.micro.atari	Subgroup for Atari's.
net.misc	Discussions too short lived for their own groups.
net.movies	Reviews and discussions of movies.
net.news	Discussions of Usenet itself.
net.news.group	Subgroup for discussions and lists of newsgroups.
net.news.map	Subgroup for maps.
net.news.newsite	Subgroup for new site announcements.
net.pets	Pets, pet care, and household animals in general.
net.politics	Political discussions. Could get hot.
net.rec	Recreational/participant sports.
net.religion	Religious, ethical, and moral implications of actions.
net.research	Research and computer research.
net.sf-lovers	Science fiction lovers' newsgroup.
net.sources	For the posting of software packages.
net.sport	Spectator sports.
net.taxes	Tax laws and advice.
net.unix-wizards	Discussions, bug reports, and fixes on and for UNIX.
	Not for the weak of heart.
net.usenix	USENIX Association events and announcements.
net.wanted	Requests for things that are needed.
	E.g. device drivers, pointers to people, etc.
net.women	Women's rights, discrimination, etc.
net.works	Assorted workstations.
fa.human-nets	Computer aided communications.
fa.info-vax	DEC's VAX line of computers.
fa.tcp-ip	TCP and IP network protocols.
fa.telecom	Telecommunications digest.

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## List of Sources for UNIX Device Drivers

*Alan S. Watt*

ITT Programming Technology Center  
1000 Oronoque Lane  
Stratford, Ct. 06497  
(203) 375-0200

uucp: ittvax!swatt  
via: decvax, duke, purdue, lbl-csam, research  
Arpa: decvax!ittvax!swatt@Berkeley

*Editors note:* this listing has appeared on USENET and is reproduced here with the permission and assistance of Mr. Watt. Minor changes have been made for consistency and to format it for the typesetter.

### How to Use This Listing

This catalog was assembled from information contributed in response to my requests over USENET. I have tried to leave the information alone, but make the formatting constant. The order presented is pretty much the order received, except where oversights on my part necessitated moving listings to the end to avoid disturbing the numbering. Each listing is numbered, and some summary information is presented under "Summary Information".

I have also tried to categorize devices into broad categories, such as "disk subsystems" for easy reference in the "Summary Information" section.

### Editorial Policy

All contributions will be accepted. I try to leave the submitted contents completely alone except to present a consistent format. My notes are enclosed in square brackets ("[]"). I obviously can accept no responsibility for the truth of any assertions contained here. Entries listed as available may have been withdrawn, or individuals listed as contacts may have moved.

Please use the format presented here as it makes my job a lot easier. Also if you give network mail addresses for UUCP, if possible specify several paths. It is always a good idea to include a U.S. Mail address and phone number.

Any additions or corrections received will be incorporated in future revisions. ALL contributions will be acknowledged; if you do not receive an acknowledgment in a reasonable period, please re-send.

### Suggestions For Shoppers

If you send network mail to people listed here for information, it is best to supply several return paths. I have had several requests which I could not answer because mail would not go the return path. Giving your phone number is also an excellent idea.

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## Revision Date

This listing reflects all submissions and corrections I have received as of May 16, 1983.

## Summary Information

There are 65 listings, some for the same device.

### 1.1 Device names in alphabetical order:

#	Mfgr., Name
45	4.2BSD distribution devices
21	AED-512
36	Alpha 10
26	Britton-Lee IDM 200 and IDM 500
43	Computrol Megalink 90-0018
16	DEC DL-11 asynchronous link to DECsystem-10
57	DEC DL-11A/B (aka KL-11) — ABLE Quadrasync is a look-alike
23	DEC DQ11 and DEC DUP11
2,41,42	DEC DR11-B, DEC DR11-W
56	DEC DU-11
13	DEC DZ-11, Plessey DZ-11, Able DZ-11
18	DEC GT41
10	DEC KMC-11
64	DEC PCL-11B
30,55	DEC RK07 and DEC RK06 disk drives
14	DEC RL01 or RL02
17	DEC RM05
19	DEC RX01
51	DEC RX02 floppy disk
34	DEC TS-11 tape drive
9	DEC VS-11
12	DEC VSV01
37	DeAnza IP 8500 image processing display system
54	Digidata look-alike for DEC TM-11/TU-10
11	Digital Sound Corporation 200 Digital Audio Converter
3	Evans and Sutherland Multi Picture System
1	Floating Point Systems Array Processors: AP-120B and FPS-100
35	Fujitsu 160 Mbyte Winchester
22	Genisco GCT-3000
52	Grinnell GMR-27 via DEC DR-11B (with minor mods)
8,25	Ikonas RDS-3000
59	Intel Corp. iSBC 215, iSBX 218, iSBX 217
60	Intel Corp. iSBC 220 SMD Disks
61	Intel Corp. iSBC 534 4-line USART board, no intelligence
62	Intel Corp. iSBC 544 4-line USART board, on-board 8085
63	Intel Corp. iSBC 550 Ethernet Controller
33,48	Interlan N1010 Ethernet board
32	Lexidata 3400 color raster display system
65	Matrox GXB-1000 Graphics Board
28	Megatek 7000
4,6,20	Megatek 7200-series
38	Optronics C-4500 Model 30D
29	Paper tape reader
53	Plessey PM-DC1100 controller with CDC9766 disk pack

;login:

46	Ramtek 9200/9300 black and white graphics display
31	Ramtek RM9400 color raster display system
50	STC 800/1600/6250bpi magtape on SI Unibus controller
39	Scientific Micro Systems FWT1127s
47	Ungermann-bass NIU via DR11-W
58	Univ. of Illinois Arpanet Terminal System IMP Interface
27	Versatec 1200, v80, or similar
15	Versatec or Varian printer/plotter
7	Xylogics Phoenix 211 Unibus Disk Controller

## 1.2 Modifications to standard drivers in alphabetical order

#	Name
40	DEC DZ11
44	tty (V7 UNIX)

## 1.3 New line Disciplines

#	Name
5	Summagraphics BitPad

## 1.4 Not really drivers

#	Name
24	Vadic 3451PA, Bizcomp Smartmodem, changes for UUCP
49	Fast timer driver

# 2. Device Types (broadly speaking)

## 2.1 Disk subsystems:

Alpha 10, DEC RK06, DEC RK07, DEC RL01 or RL02, DEC RM05, DEC RX01, DEC RX02 floppy disk, Fujitsu 160, Plessey PM-DC1100 controller with CDC9766 disk pack, Scientific Micro Systems FWT1127s, Xylogics Phoenix 211, Intel Corp. iSBC 215, iSBX 218, iSBX 217, Intel Corp. iSBC 220 SMD Disks

## 2.2 Tape subsystems:

DEC TS-11, Digidata look-alike for DEC TM-11/TU-10, STC tri-density

## 2.3 Graphics display devices:

AED-512, DEC GT41, DEC VS-11, DEC VSV01, DeAnza IP 8500, Evans and Sutherland Multi Picture System, Genisco GCT-3000, Grinnell GMR-27 via DEC DR-11B (with minor mods), Ikonas RDS-3000, Lexidata 3400, Megatek 7000, Megatek 7200-series, Ramtek 9200,9300, Ramtek RM9400, Matrox GXB-1000

## 2.4 Communication devices:

Able DZ-11, Computrol Megalink 90-0018, DEC DL-11, DEC DQ11, DEC DR11-B, DEC DR11-W, DEC DU-11, DEC DUP11, DEC DZ-11, DEC KMC-11, DEC PCL-11B, Interlan N1010 Ethernet, Plessey DZ-11, Ungermann-Bass NIU via DR11-W, Arpanet IMP, Intel Corp. iSBC 534 4-line USART board with no intelligence, Intel Corp. iSBC 544 4-line USART board with on-board 8085, Intel Corp. iSBC 550 Ethernet Controller

## 2.5 Printers:

Versatec 1200, Versatec or Varian printer/plotter, Versatec v80



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## 2.6 Miscellaneous:

Britton-Lee IDM 200 and IDM 500, Digital Sound Corporation 200 Digital Audio Converter, Floating Point Systems AP-120B and FPS-100 array processors, Optronics C-4500 Model 30D, Perkin-Elmer paper tape reader

## 3. CPU types covered

DEC LSI-11, Intel 286, Intel 8086, PDP-11, Perkin-Elmer 7/32 and 8/32, VAX-11

## 4. UNIX types covered

2.8BSD, 4.0BSD, 4.1BSD, 4.1aBSD, 4.2BSD, Microsoft Xenix, PWB/UNIX, SRI's PDP-11 port of 4.1aBSD, V6, V7, Wollongong/P-E Edition VII

## Driver Listings

### Listing # 1

Device Name: Floating Point Systems Array Processors: AP-120B and FPS-100; FPS-164 and FPS-564 in development.  
Computer Design and Applications MSP-3000 in development.

Device Type: High Speed Floating Point Array Processors

CPU Type: VAX 11/780 11/750 11/730, PDP-11, Perkin Elmer (in development)

UNIX Version: 4.1 BSD, V6, V7

Availability: Anyone

Terms & Cond.: \$5000, includes large program development package (assembler, compiler, simulator, libraries, diagnostics) + signed copy of license agreement. Source is distributed.

Contact: Peter H. Berens  
Apunix Computer Services  
1380 Garnet Ave., Suite E-292  
San Diego, CA 92109  
619-452-7819  
decvax!ittvax!dcdwest!phb  
ucbvax!sdcsvax!sdchema!phb

### Listing # 2

Device Name: DEC DR11-B (should work for DR11-W, too). Currently used for Grinnell Frame Buffer.

Device Type: 16 bit parallel DMA interface

CPU Type: VAX and PDP-11

UNIX Version: 4.1BSD, UNIX V7

Availability: Anybody

Terms & Cond.: For just driver, can send over net. For driver+user level software for Grinnell FB, send tape with return postage or can send over net on Arpanet, or pay for phone time yourself.

;login:

**Listing # 7**

Device Name: Xylogics Phoenix 211 Unibus Disk Controller

Device Type: CDC, Ampex 80/300 Mb SMD drives

CPU Type: VAX, PDP-11

UNIX Version: 4.1BSD, 2.8BSD

Availability: Sure

Terms & Cond.: Send me a tape, or get it by net-mail

Contact: Donn Seeley or Jim McGinness  
Mail Code B-014  
UC San Diego Chemistry Dept.  
La Jolla CA 92037  
ucbvax!sdcsvax!sdchemc!{donn,jmcg}

Caveats: I think Xylogics has discontinued production because of reliability problems... but I can say that once you get a good board set (it took us 3 mo.) then it runs fine. The cute thing about the controller and drivers is that they support multi-porting of the controller. The controller is connected to as many as 4 couplers; the couplers sit in the various Unibuses and the controller has its own backplane and power supply. We boot a VAX and a PDP off the same disk and controller.

Notes: By the way, the 4.1 driver was adapted by Rusty Wright of the Center for Music Experiment at UCSD from the up driver and the 2.8 driver has an odd pedigree which I don't remember just now. The 4.1 driver has fixed an apparent bug in the up driver whereby on systems with more than one drive on the same controller the "wrong" drive queue will occasionally be linked into the controller queue... sigh. Standalone boot drivers, bootblocks and even VAX 11/750 ROM code available on request. Other people at UCSD may have different versions of this driver but I have gotten the impression that ours is the only version that works (it may be that ours are the only controllers that work(!)).

**Listing # 8**

Device Name: Ikonas RDS-3000

Device Type: Image Frame Buffer

CPU Type: VAX

UNIX Version: Berkeley 4.1 and 4.2

Availability: Anyone with UNIX license

Terms & Cond.: Experimental, non-supported.

Contact: decvax!allegra!rdg

**Listing # 9**

Device Name: DEC VS-11

Device Type: High-resolution, bitmapped, interactive, color graphics display/workstation.

CPU Type: VAX

UNIX Version: 4.1BSD

Availability: Any licensee, but not for redistribution or resale

Terms & Cond.: Free.

Contact: DEC UNIX Engineering Group (decvax)  
decvax!aps

;login:

#### **Listing # 10**

Device Name: DEC KMC-11  
Device Type: PDP-11 Auxiliary Processor  
CPU Type: PDP-11's  
UNIX Version: V6, V7, perhaps others  
Availability: Anyone who wants it  
Terms & Cond.: Driver source is ~3K bytes long. Send UUCP address.  
Contact: Michael Lecuyer  
Arts Computing Office  
P.A.S. Building  
University of Waterloo  
Waterloo, Ontario Canada N2L 3G1  
decvax!watmath!watarts!spoon  
Notes: Loads an 'a.out' image (both text portion and data) into KMC-11 memory.

#### **Listing # 11**

Device Name: Digital Sound Corporation 200 Digital Audio Converter  
Device Type: digital to analog and analog to digital converter  
CPU Type: VAX  
UNIX Version: 4.1BSD  
Availability: anybody with a 32V or System III license (source or binary)  
Terms & Cond.: send tape or uucp address  
Contact: ucbvax!sdcarl!rusty  
Rusty Wright  
University of California San Diego  
Computer Audio Research Laboratory  
La Jolla, California 92093

#### **Listing # 12**

Device Name: DEC VSV01  
Device Type: Non-DMA Bit Map Colour Television  
CPU Type: PDP-11  
UNIX Version: V6  
Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
decvax!utzoo!utcsrgv!utcsstat!geoff

#### **Listing # 13**

Device Name: DEC DZ-11, Plessey DZ-11, Able DZ-11  
Device Type: Non-DMA tty multiplexer  
CPU Type: PDP-11  
UNIX Version: V6 or V7

;login:

Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
decvax!utzoo!utcsrgv!utcsstat!geoff

**Listing # 14**

Device Name: DEC RL01 or RL02  
Device Type: 5 or 10 Mb removable disk  
CPU Type: PDP-11  
UNIX Version: V6  
Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
decvax!utzoo!utcsrgv!utcsstat!geoff

**Listing # 15**

Device Name: Versatec or Varian printer/plotter  
Device Type: electrostatic raster plotter  
CPU Type: PDP-11  
UNIX Version: PWB/UNIX (essentially V6) and after Jan. 1, 1983, V7  
Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
decvax!utzoo!utcsrgv!utcsstat!geoff

**Listing # 16**

Device Name: DEC system-10 asynchronous link via DEC DL-11  
Device Type: 1200 or 2400 baud (approx.) link with checksum, retransmission  
CPU Type: PDP-11  
UNIX Version: PWB/UNIX (essentially V6) and after Jan. 1, 1983, V7  
Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
decvax!utzoo!utcsrgv!utcsstat!geoff  
Caveats: requires some DECsystem-10 programs and UNIX programs (available from me) to make a complete link

;login:

**Listing # 17**

Device Name: DEC RM05  
Device Type: 300 Mb removable disk  
CPU Type: PDP-11  
UNIX Version: PWB/UNIX (essentially V6) and after Jan. 1, 1983, V7  
Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
          decvax!utzoo!utcsrgv!utcsstat!geoff

**Listing # 18**

Device Name: DEC GT41  
Device Type: vector graphics display including display processor  
CPU Type: PDP-11  
UNIX Version: V6 and eventually V7  
Availability: everyone  
Terms & Cond.: send a tape or I can mail it  
Contact: Geoff Collyer  
          decvax!utzoo!utcsrgv!utcsstat!geoff  
Notes: Actually I have several GT41 drivers.

**Listing # 19**

Device Name: DEC RX01  
Device Type: Single sided single density floppy disk drive.  
CPU Type: PDP-11/40  
UNIX Version: V6.  
Availability: I don't remember where I acquired it, so I can't enforce restrictions. I.e., for any licensed UNIX system. But don't market it.  
Terms & Cond.: I don't want to spend any of my money or a lot of my time shipping it. It is 4606 chars or 212 lines.  
Contact: Charles Colbert  
          Rm 2e222  
          6 Corporate Plc.  
          Piscataway, NJ 08854  
          (201) 981-2370  
          mhuxm!pyuxjj!colbert  
          ucbvax!pyuxjj!colbert  
Caveats: The RX01 hardware does not use DMA, so it is very slow & hoggy. It is also very low density.

;login:

**Listing # 20**

Device Name: Megatek 7250  
Device Type: Color graphics system (vector/raster hybrid)  
CPU Type: PDP-11/45  
UNIX Version: V7  
Availability: Anyone  
Terms & Cond.: Not for resale or redistribution. Send magtape.  
Contact: Jim Guyton  
guyton@rand-unix, randvax!guyton  
Caveats: Not used very much and not very polished. A derivation of a Megatek 7200 UNIX-V6 driver from Purdue.

**Listing # 21**

Device Name: AED-512  
Device Type: Color raster system  
CPU Type: PDP-11/45  
UNIX Version: V7  
Availability: Anyone  
Terms & Cond.: Not for resale or redistribution. Send magtape.  
Contact: Jim Guyton  
guyton@rand-unix, randvax!guyton  
Caveats: Weird AED dma mode not supported. Still uses PIO for all but direct video buffer loads.

**Listing # 22**

Device Name: Genisco GCT-3000  
Device Type: Color raster system  
CPU Type: PDP-11/45  
UNIX Version: V7  
Availability: Anyone  
Terms & Cond.: Not for resale or redistribution. Send magtape.  
Contact: Jim Guyton  
guyton@rand-unix, randvax!guyton  
Caveats: Runs with custom Rand microcode for the Genisco, not the standard code supplied by Genisco. Also, this is a horrible device, don't buy one!

**Listing # 23**

Device Name: DEC DQ11 and DEC DUP11  
Device Type: Synchronous line interfaces, DMA and non-DMA respectively.  
Protocol: Honeywell Grts remote computer bisync; probably not too difficult to modify for similar protocols.  
CPU Type: written for VAX

;login:

UNIX Version: 4.1BSD  
Availability: to anyone  
Terms & Cond.: prefer to send via uucp mail.  
Contact: decvax!watmath!watcgl!dmmartindale  
Dave Martindale  
Computer Graphics Lab  
University of Waterloo  
Waterloo, Ontario  
Canada N2L 3G1

#### Listing # 24

Device Name: Vadic 3451PA Autodialer/triple modem  
Device Name: Bizcomp Smartmodem (300 baud only — I haven't seen the 1200 baud version yet)  
Device Type: RS 232 Autodialers for UUCP  
CPU Type: any (including micros)  
UNIX Version: any which supports uucp  
Availability: anyone  
Terms & Cond.: send electronic mail  
Contact: Peter Gross  
High Altitude Observatory  
National Center for Atmospheric Research  
PO Box 3000  
Boulder CO 80307  
(303)-494-5151 ext. 348  
seismo!hao!pag  
decvax!brl-bmd!hao!pag  
ucbvax!hplabs!hao!pag  
CSVAX.pag@BERKELEY  
Notes: There are separate versions (the only changes are in conn.c) for the VA3451PA and the Hayes Smartmodem.

#### Listing # 25

Device Name: Ikonas RDS-3000 (IK-11B)  
Device Type: Host interface to Ikonas' Raster Display System  
CPU Type: VAX, PDP-11  
UNIX Version: 4.1BSD, V7  
Availability: Anyone can have the V7 driver. Send for information on the 4.1BSD driver.  
Terms & Cond.:  
Contact: Mike Mitchell  
Ikonas Graphics Systems, Inc.  
531 Pylon Drive  
Raleigh, NC 27606  
decvax!duke!mcnc!mcm

;login:

**Listing # 33**

Device Name: Interlan N1010 Ethernet board.  
Device Type: Ethernet controller  
CPU Type: VAX  
UNIX Version: 4.1BSD with the BBN TCP/IP network software  
Availability: Available free with proof of UNIX license  
Contact: decvax!mcnc!swd (Stephen Daniel)  
Caveats: Still a prototype driver. It works, but performance is poor.

**Listing # 34**

Device Name: DEC TS-11 tape drive  
Device Type: 1600 bpi (only) 9 track tape drive.  
CPU Type: PDP-11 (ours is an 11/44)  
UNIX Version: 2.8 BSD  
Availability: Public domain.  
Terms & Cond.: We'll send it by netmail, or by tape (you supply the tape, it will be 1600 bpi).  
Contact: pur-ee!pur-phy:suitti, or to pur-ee!pur-phy:root  
(there is always the possibility of change of command.)  
Caveats: I've not seen any bugs in 6 months of use. This device driver was written here at Purdue Physics by Mike Demoney. The one that comes with the BSD's is overly buggy, tending to crash the system.  
Stephen Uitti (system manager)  
pur-ee!pur-phy:suitti

**Listing # 35**

Device Name: Fujitsu 160 Mbyte Winchester with System Industries 9400 controller  
CPU Type: 11/70  
UNIX Version: Version 7  
Availability: Anybody  
Terms & Cond.: Send tape.  
Contact: Gary Schlickeiser  
Academic Computing  
Reed College  
Portland, OR 97202  
(503) 771-1112 x571  
teklabs!reed!schlick

**Listing # 36**

Device Name: Alpha 10 from Iomega Corp., Ogden Utah  
Device Type: 10 Mbyte Cartridge Floppy  
CPU Type: 11/23  
UNIX Version: Version 7  
Availability: Anybody



;login:

Terms & Cond.: Send tape.

Contact: Gary Schlickeiser  
Academic Computing  
Reed College  
Portland, OR 97202  
(503) 771-1112 x571  
teklabs!reed!schlick

**Listing # 37**

Device Name: DeAnza IP 8500 image processing display system  
CPU Type: VAX 780, 750, 11/45  
UNIX Version: 4.1BSD, PWB1.0  
Availability: Just request it  
Contact: duke!adiron!bob (bob gray)

**Listing # 38**

Device Name: Optronics C-4500 Model 30D  
Device Type: Color film scanner/writer  
CPU Type: Unibus Device on a VAX 11/780  
UNIX Version: 4.1BSD  
Availability: An educational/research product. Commercial use to be negotiated.  
Terms & Cond.: To be arranged.  
Contact: Robert J. Woodham  
lbl-csam!uw-beaver!ubc-vision!woodham  
Department of Computer Science  
University of British Columbia  
2075 Wesbrook Mall  
Vancouver, B.C. V6T 1W5 Canada  
(604) 228-4368

**Listing # 39**

Device Name: Scientific Micro Systems FWT1127s  
Device Type: Floppy disk drive, RX02 substitute with "extended mode" that provides multiple sector DMA transfers, a format command, and supports several IBM formats  
CPU Type: VAX  
UNIX Version: 4.0BSD  
Availability: to anyone  
Terms & Cond.: send tape with self addressed and STAMPED envelope or send uucp address  
Contact: Daniel R. Strick  
Office of Communications Programs  
University of Pittsburgh  
833 LIS building  
135 N. Bellefield Ave.  
Pittsburgh, PA 15260  
duke!mcnc!idis!dan

;login:

## **Local UNIX User's Groups**

The Association office has received information on three local UNIX groups.

Front Range Users Group  
N.B.I., Inc.  
P.O. Box 9001  
Boulder, CO 80301  
Attn.: Wally Wedel  
(303) 938-2923

Dallas / Fort Worth UNIX User's Group  
Advanced Computer Seminars  
2915 L.B.J. Freeway, Suite 161  
Dallas, TX 75234  
Attn.: Irv Wardlow  
(214) 484-UNIX

The Front Range group meets about every two months at different UNIX sites for informal discussions.

There is also an informal group in the Washington, D.C., area that meets every two months or so. The current contact for that group is

Neil Groundwater  
Analytic Disciplines, Inc.  
Suite 300  
8320 Old Courthouse Road  
Vienna, VA 22180  
(703) 893-6140  
npg@lbl-csam

The office often receives questions from people trying to find local UNIX user's groups; if you know of a group in your area please let us know so we can share the information. The office is maintaining a list of local groups and will publish it in ;login: periodically.

## **Association Office Report**

The office will have a desk at the Toronto Conference to handle memberships, resolve questions and problems, and receive software contributions and papers for the proceedings.

### **Software Distribution Tapes**

The office has mailed 1983 Software Distribution Tape release forms to the Institutional delegate for each 1983 Institutional member.

Contributions for the next Distribution Tape may be submitted at the Association office desk at Toronto or may be mailed to the office.

## Request for Proposal for a Computer for the USENIX Association

*Editor's note:* The following request for proposal has been sent to all companies that exhibited at past USENIX meetings. Other companies are invited to respond.

May 31, 1983

The USENIX association has outgrown its current UNIX timesharing facilities and has decided to purchase a small computer system. The system will be used to maintain our membership database and various mailing lists, and to prepare our newsletter. You are invited to submit a system proposal for our consideration. Our selection of the best proposal will be based on cost, memory+disk per dollar, performance, expandability, reliability and maintenance. All proposals which meet our requirements will be considered, but USENIX retains the right to accept any or none of the proposals received.

Subsequent to choosing a system, we will include an article in our newsletter describing our new computer system, and print a notice in each newsletter identifying the computer system on which the newsletter was generated.

### Requirements:

- Service at least 6 interactive users without excessive degradation
- UNIX Version 7, System III, Berkeley 4.x
- 512K bytes main memory (or more)
- 8 serial lines
- 40 megabytes of disk (or more)
- 1/2" 9 track 1600 bpi (or 1600/800 bpi) tape
- Berkeley additions: *vi*, *csk*, *vtroff*
- All standard UNIX utilities (*awk*, *sed*, *bc*, *uucp*, etc.)
- Native C compiler + loader + libraries
- Maintenance repair on a board/disk/power-supply basis within 24 hours.

### Preferences:

- Standard bus, such as Multibus, Q-Bus, etc.
- SMD disk interface
- Fujitsu 80MB disk (2312) or equivalent
- Berkeley 4.x UNIX
- Under \$20,000

Your company must demonstrate responsiveness in fixing software problems. Appropriate documentation on system maintenance, specifically on file backup and recovery, must be provided.

Our newsletter is produced with *nroff* and *troff* and the —me macro package and will normally run only with several bug fixes to the standard Version 7 releases of these programs. USENIX must be able to work with you to build versions which we can use.

Your proposal should include a price for the specified system, as well as the cost for additions/upgrade to more memory, disk, serial lines, and another tape drive. Please include fixed prices or price basis for repairs at the system and/or component level. In order for us to analyze your system performance, we need to know the system architecture, cpu, cpu speed, memory and bus wait states, disk and tape speeds, and bus performance.

If you are interested in submitting a proposal, please address it to me at the USENIX office. Proposals must be in our office by July 1, 1983. We will review all the proposals and purchase a system (if one of the proposals meets our needs) by the end of July.

;login:

Thank you for your consideration of this request for proposal.

Sincerely,  
USENIX Association

Bruce S. Borden  
Director

### **San Diego Proceedings**

The proceedings for the San Diego UNICOM meeting went to the printer on June 6. They are about 380 pages long. They will be mailed as soon as they are received from the printer.

;login:

## USENIX Association

### Application for Institutional Membership for Calendar Year 1983

*Please type or print*

☐ New ☐ Renewal

Name of Institution \_\_\_\_\_

Dept / Campus / Plant site: \_\_\_\_\_

The annual dues depend on the type of license held; check one:

☐ \$100: Educational license

☐ \$300: AT&T or subsidiary (non-voting membership)

☐ \$300: Other license

For the CPU at your plant site or campus please indicate the type of license(s) held by **S** (for source) or **B** (for binary)

\_\_\_\_ Version 6    \_\_\_\_ Phototype.    \_\_\_\_ PWB/UNIX    \_\_\_\_ Version 7    \_\_\_\_ 32V  
\_\_\_\_ System III    \_\_\_\_ System V    \_\_\_\_ UNIX/TSS    \_\_\_\_ UNIX/UNIVAC  
\_\_\_\_ Other: \_\_\_\_\_

Name and work address of the Institutional delegate. This person will receive all official correspondence and the renewal notice for next year.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

uucp address: \_\_\_\_\_

Name and work address of the person to receive the newsletter and software distributions.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_

uucp address: \_\_\_\_\_

☐ Check enclosed: \$\_\_\_\_\_ ☐ Purchase order enclosed; invoice required

Authorized Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Please return the completed form to the address below with copies of the following pages of the license for your CPU: the signature page and the pages that show the version of UNIX you are licensed for, whether it is for source or binary, the name of the institution owning the license, and the type, serial number, and location of the CPU(s). If you have more than one license please send the above information for each license.

This form **must** accompany your purchase order or payment. You will receive a card acknowledging your membership as soon as it is processed.

USENIX Association  
P.O. Box 7  
El Cerrito, CA 94530

Inst: .....  
Del: .....  
Mem#: ..... Check #: .....  
Lic: .....  
Date: .....  
Db: .....

**USENIX Association**  
**P.O. Box 7**  
**El Cerrito, CA 94530**

**First Class Mail**



**Toronto Conference Agenda**  
**Joining Usenet**  
**Device Driver Catalog**